

## **ABSTRACT OF THE DISCLOSURE**

The following techniques for word-level networks are presented:  
constraints solving, case-based learning and bit-slice solving. Generation of a  
word-level network to model a constraints problem is presented. The networks  
5 utilized have assigned, to each node, a range of permissible values.

Constraints are solved using an implication process that explores the  
deductive consequences of the assigned range values.

The implication process may include the following techniques: forward or  
backward implication and case-based learning. Case-based learning includes  
10 recursive or global learning.

As part of a constraint-solving process, a random variable is limited to a  
single value. The limitation may be performed by iterative relaxation. An  
implication process is then performed. If a conflict results, the value causing the  
conflict is removed from the random variable by range splitting, and backtracking  
15 is performed by assigning another value to the random variable.

A procedure is provided for efficiently solving bit-slice operators.